What is claimed is:

1. A method for measuring the function or response of a selected subset of lymphocytes in a test sample containing a mixed population of cells types, to a mitogen or antigen comprising:

a) incubating said sample with said mitogen or said antigen; and

b) detecting the level of ATP in said selected subset of lymphocytes.

2. A method as in claim 1 wherein step b) comprises:

i) contacting said sample with a solid support having a specific binding substance, said binding substance being specific for at least one characteristic determinant of said subset of lymphocytes, resulting in the formation of a complex of cells and solid support;

ii) separating said complex from the remainder of said sample;

iii) adding to said complex a solution to lyse any cells in said complex; and

iv) detecting the level of ATP in the lysis product of step iii).

3. A method according to claim 1, wherein said mitogen is a T lymphocyte mitogen.

4. A method according to claim 1, wherein said antigen is an infectious organism.

5. A method as in claim 4 where said infectious organism is a virus or bacteria or a subcomponent thereof.

6. A method according to claim 1, wherein said antigen is a protein or peptide.

7. A method according to claim 1, wherein said subset of lymphocytes is selected from the group consisting of T lymphocytes, helper T lymphocytes, TH1 lymphocytes, TH2 lymphocytes, natural killer T lymphocytes, cytotoxic T lymphocytes, and suppressor T lymphocytes.

8. A method according to claim 2, wherein said determinant of T cells is a functional marker, a marker of a particular differentiation stage, or an activation marker.

9. A method according to claim 2, wherein said solid support comprises magnetic or paramagnetic material.

10. A method as in claim 9 wherein in step ii) said complex is separated by magnetic separation.

11. A method according to claim 2, wherein said solid support comprises polystyrene.

12. A method according to claim 2, wherein step iv) is conducting a bioluminescent reaction using luciferase and luciferin.

13. A method according to claim 2, wherein the said specific binding substance is an antibody.

14. A method according to claim 2, wherein said specific binding substance is a cytokine.

15. A method according to claim 2, wherein step i) comprises (a) contacting said sample with a first binding substance of a binding pair which specifically binds to at least one cell surface determinant which is common to said subset of lymphocytes and, b) contacting the product of step a) with a solid support having a second binding substance of said binding pair which specifically binds said first binding substance.

16. A method according to claim 15 wherein said binding pair is comprised of two antibodies, a first antibody recognizing said cell surface determinant and a second antibody recognizing said first antibody.

17. A method according to claim 15 wherein said binding pair comprises biotin and avidin.

18. A method according to claim 1 wherein a standard sample is also subjected to step b) and the level of ATP of said test sample is compared to said standard sample.

19. A method according to claim 18 wherein said standard sample is liposomes containing ATP .

20. A method according to claim 1 wherein the total time required for performing all steps is 6-72 hours.

21. A method according to claim 1 wherein said subset of lymphocytes are B lymphocytes.

22. The method according to claim 1 further comprising the step of comparing the level of ATP in said sample with a standard level of ATP.

23. A method for measuring the function or response of a selected subset of lymphocytes in a test sample containing a mixed population of cells types, to a mitogen or antigen comprising:

a) dividing said test sample into two or more portions;

b) incubating at least one of said portions with said mitogen or antigen, and incubating at least one of said portions without said mitogen or antigen;

c) contacting each portion with a solid support having a specific binding substance, said binding substance being specific for at least one characteristic determinant of said subset of lymphocytes, resulting in the formation of a complex of cells and solid support for each portion;

d) separating said complex from the remainder of said sample for each portion;

e) washing said complex for each portion;

f) adding to each complex a solution that will lyse any cells in said complex;

g) measuring the level of ATP in each of the lysis products of step f), and

h) comparing the results of step g) for each of said portions that have been exposed to said mitogen or antigen with each of said portions that have not been exposed to said mitogen or antigen.

24. The method according to claim 23 wherein washing step e) is performed with a solution that lyses red blood cells.

25. The method according to claim 23 wherein washing step e) is performed with a solution that lyses platelets.

26. A method according to claim 23 wherein said characteristic determinant is selected from the group consisting of CD69, CD25, CD26, CD 27, CD28, MHC Class II antigens, and CD71.

27. A method for determining the response of T lymphocytes within a test sample containing a mixed populations of cells to an antigen or mitogen comprising:

a) dividing said test sample into two or more portions;

b) contacting at least one of said portions of said test sample with said mitogen or antigen, and not contacting at least one of said portions of said test sample with said mitogen or antigen;

c) contacting each portion with a solid support having a specific binding substance, said binding substance being specific for at least one determinant on the surface of said T lymphocytes, resulting in the formation of a complex of cells and solid support;

d) separating said complex from the remainder of said sample for each portion;

e) washing said complex for each portion;

f) adding to each complex a solution that will lyse any cells in said complex;

g) measuring the level of ATP in each of the lysis products of step f), and

h) comparing the results of step g) for each of said portions that have been exposed to said mitogen or antigen with each of said portions that have not been exposed to said mitogen or antigen.

28. A method according to claim 27 wherein the concentration of said determinant increases as a result of the response of said T lymphocytes to said antigen or mitogen.

29. A test kit for determining the response of a set or subset of a subpopulation of cells in a test sample to mitogen or antigen, said test kit comprising:

a) a vial containing said antigen or mitogen; and

b) means for measuring ATP level in said set or subset.

30. A test kit as in claim 29 wherein said means for measuring ATP level comprises magnetic beads coated with antibody specific for said set or subset of cells, and a vial containing luciferase and luciferin.

31. A test kit as in claim 30 further comprising a vial containing culture media for dilution of said test sample, and a vial containing wash solution for washing a complex of said beads with said set or subset of cells.